We claim:

1. A process for the preparation of ethyleneamines by continuous reaction of ethylenediamine (EDA) in the presence of a heterogeneous catalyst, which comprises carrying out the reaction in a reaction column.

2. A process for the preparation of ethyleneamines as claimed in claim 1, where the ethyleneamines are diethylenetriamine (DETA), piperazine (PIP) and/or triethylenetetramine (TETA).

3. A process as claimed in claims 1 or 2, wherein the absolute pressure in the column is in the range from > 0 to 20 bar.

4. A process as claimed in any of the preceding claims, wherein the temperature in the section of the column in which the reaction of EDA to ethyleneamines takes place (reaction zone) is in the range from 100 to 200°C.

5. A process as claimed in any of the preceding claims, wherein the number of theoretical plates in the column is in the range from 5 to 100 in total.

6. A process as claimed in any of the preceding claims, wherein the number of theoretical plates in the reaction zone is in the range from 1 to 30.

7. A process as claimed in any of the preceding claims, wherein the number of theoretical plates in the enriching section above the reaction zone is in the range from 0 to 30.

8. A process as claimed in any of the preceding claims, wherein the number of theoretical plates in the stripping section below the reaction zone is in the range from 0 to 40.

9. A process as claimed in any of the preceding claims, wherein the catalyst used in the reaction zone is a catalyst comprising Ni, Co, Cu, Ru, Re, Rh, Pd and/or Pt or a shape-selective zeolite catalyst or a phosphate catalyst.

10. A process as claimed in any of the preceding claims, wherein the catalyst used in the reaction zone is a catalyst comprising Pd and zirconium dioxide support material.

11 A process as claimed in any of the preceding claims, wherein the catalyst is introduced into the reaction column in the form of a loose bed.

12. A process as claimed in any of the preceding claims, wherein the catalyst is introduced into a distillation packing in the form of a loose bed.

13. A process as claimed in any of claims 1 to 10, wherein the catalyst is in the form of a coating on a distillation packing.

14. A process as claimed in any of claims 1 to 10, wherein the catalyst is in a retention container situated above the column.

15. A process as claimed in any of the preceding claims, wherein the addition of EDA to the column takes place in liquid form below the reaction zone.

16. A process as claimed in any of claims 1 to 14, wherein the addition of EDA to the column takes place in gaseous form below the reaction zone.

17. A process as claimed in any of claims 1 to 14, wherein the addition of EDA to the column takes place in liquid form above the reaction zone.

18. A process as claimed in any of the preceding claims, wherein EDA is passed to the column in a purity of > 98% by weight.

19. A process as claimed in any of the preceding claims, wherein the column comprises introduced EDA, piperazine (PIP) and/or other ethyleneamines.

20. A process as claimed in any of the preceding claims, wherein the reaction is carried out in the presence of hydrogen.

21. A process as claimed in the preceding claim, wherein the reaction is carried out in the presence of from 0.0001 to 1% by weight of hydrogen, based on the feed amount of EDA.

22. A process as claimed in either of the two preceding claims, wherein the addition of hydrogen to the column takes place below the reaction zone.

23. A process as claimed in any of the preceding claims, wherein a mixture of ammonia, other components with a boiling point lower than DETA (low-boiling components) and optionally hydrogen is removed via the top of the column.

24. A process as claimed in the preceding claim, wherein the mixture removed from

the top of the column also comprises partial amounts of unreacted EDA.

25. A process as claimed in either of the two preceding claims, wherein the mixture removed overhead is partially condensed, and during this ammonia and optionally hydrogen are removed predominantly in gaseous form, and the liquefied fraction is fed to the column as reflux.

26. A process as claimed in any of the preceding claims, wherein the weight ratio of the amount of reflux in the column to the amount of feed to the column is in the range from 0.1 to 30.

27. A process as claimed in any of the preceding claims, wherein a mixture of DETA, piperazine (PIP), TETA and other components with a boiling point higher than DETA (high-boiling components) is removed by the bottom of the column.

28. A process as claimed in the preceding claim, wherein the mixture removed by the bottom of the column also comprises partial amounts of unreacted EDA or the total amount of unreacted EDA.

29. A process as claimed in any of the preceding claims, wherein the column below the reaction zone is divided by a side take-off.

30. A process as claimed in the preceding claim, wherein unreacted EDA, PIP or mixtures thereof are removed via the side take-off.

31. A process as claimed in any of the preceding claims, wherein product removed via the side take-off comprises DETA.

32. A process as claimed in any of the three preceding claims, wherein product produced via the side take-off is removed in liquid form.

33. A process as claimed in any of claims 29 to 31, wherein product produced via the side take-off is removed in gaseous form.

34. A process as claimed in any of the preceding claims for producing DETA at a selectivity of > 20%, based on EDA, coupled with an EDA conversion of > 30%.